# BEFORE THE STATE CORPORATION COMMISSION OF THE STATE OF KANSAS

In the Matter of Atmos Energy's Compliance	)	
Filing of its Accelerated Pipe Replacement Plan	)	Docket No. 18-ATMG-316-CPL
Pursuant to Docket No. 15-GIMG-343-GIG	)	

## SUBMITTAL OF ANNUAL REPORT OF ATMOS ENERGY CORPORATION

Pursuant to the recommendations included in the Kansas Corporation Commission ("Commission") Staff's ("Staff") Memorandum filed in the above referenced proceeding on December 19, 2018 ("Staff Memorandum"), Atmos Energy Corporation ("Atmos Energy" or "Company") respectfully submits the attached annual report to provide information on progress made since Atmos Energy submitted its Plan for Systematic Accelerated Replacement of Bare Steel Service/Yard Lines and Bare Steel Mains Within Class 3 Locations/Urban Areas ("343 Plan") on April 24, 2018.

- 1. Atmos Energy has historically and continues to engage in extraordinary investment accelerating replacement of obsolete infrastructure beyond required levels to benefit our customers through the enhanced safety and reliability of our system. Over the past decade in Kansas, Atmos Energy has been investing in its infrastructure by replacing industry-identified obsolete materials, including bare steel mains and service lines, and has recovered its costs through general rate cases as well as utilizing the provisions of the Gas Safety and Reliability Policy Act of 2006 to the greatest extent possible to achieve that goal.
- 2. Ultimately in Docket No. 15–GIMG-343-GIG ("343 Docket"), the Commission issued an Order dated September 12, 2017 ("343 Order"), with findings recognizing the need for accelerated pipeline replacement and providing as an option for a solution to address that need an Accelerated Pipeline Program ("ARP"), which contemplates an annual filing of upcoming projects

and subsequent "annual compliance reports detailing progress made in the last year, explaining any deviation from initial projections, and revising remaining plan projections." 343 Order at 94. For the reasons outlined in its subsequent filings, it was not feasible for Atmos Energy to utilize the ARP as a mechanism to achieve the common goal of further acceleration of pipeline replacement investment. However, the Company submitted its 343 Plan outlining, in a general way, a way to systematically accelerate the replacement of bare steel mains in urban areas and all bare steel service lines over an anticipated period of 35 years.

- 3. In the Staff Memorandum, the Staff recommended that each utility file an annual compliance report by March 31 "detailing progress made in the preceding year, explaining any deviation from the preceding year's projections, any deviation from initial projections, and revising remaining plan projections. . . . Staff also recommends the annual report contain an update of parameters similar to those listed in Tables LMH-1 and LMH-2 that are included in the body of this Report and Recommendation."
- 4. Atmos Energy remains steadfast in its commitment to the safety of our customers and continues to make substantial accelerated investments in the safety and reliability of its system, of which the investment that meets the characteristics described in the 343 Order is only a subset. To the extent applicable, Atmos Energy has developed the attached Annual Report addressing the topics outlined in the Staff Memorandum. However, for several reasons, the Annual Report necessarily does not align exactly with that contemplated in the 343 Order. First, Atmos Energy did not file an ARP Plan with which to compare any historical data available. Second, the annual report contemplates that a historical year has already passed since the implementation of any accelerated replacement plan pursuant to the 343 Order. However, in its 343 Plan, Atmos Energy

indicated that it would begin this plan in January 2019; thus, there is no historical year with which to compare the data. Third, Atmos Energy plans its projects on a fiscal year basis, so the data requested on a calendar year basis may not provide an informative year-over-year comparison.

5. Atmos Energy looks forward to continuing to work with the Commission to expand the systematic replacement described in the 343 Plan to include replacement of additional obsolete materials in both urban and rural areas across Kansas and to develop the rate recovery necessary to support that investment. As these efforts continue and Atmos Energy has historical data pursuant to those efforts, Atmos Energy will work with the Staff to develop an even more robust annual reporting format that aligns with the methodology and approach ultimately used for pipeline replacement and provides the Commission with even more transparency and oversight of the implementation of our common goal of accelerated pipeline replacement.

Respectfully submitted, this the 1<sup>st</sup> day of April, 2019.

ATMOS ENERGY CORPORATION

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### **VERIFICATION**

STATE OF KANSAS	)
	)ss:
COUNTY OF FRANKLIN	)

James G. Flaherty, of lawful age, being first duly sworn on oath, states:

That he is the attorney for Atmos Energy Corporation, named in the foregoing Compliance Filing, and is duly authorized to make this affidavit; that he has read the foregoing Compliance Filing, and knows the contents thereof; and that the facts set forth therein are true and correct.

James G. Flaherty

SUBSCRIBED AND SWORN to before me this 1st day of April, 2019.

NOTARY PUBLIC - State of Kansas

RONDA ROSSMAN

My Appt. Exp. 5/25/22

Rouda Rossinger Notary Public

Appointment/Commission Expires:

# **CERTIFICATE OF SERVICE**

I hereby certify that a copy of the above and foregoing was sent via U. S. Mail, postage prepaid, hand-delivery, or electronically, this  $1^{\rm st}$  day of April, 2019, addressed to:

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James G. Flaherty

#### **ATMOS ENERGY 2019 ANNUAL REPORT**

#### **Introduction**

Since the filing of its Plan for Systematic Accelerated Replacement of Bare Steel Service/Yard Lines and Bare Steel Mains within Class 3 Locations/Urban Areas ("343 Plan") on April 24, 2018, Atmos Energy has continued its proactive approach to risk assessment and pipeline replacement to continue to advance the safety and reliability of its system for the benefit of its Kansas customers to the extent possible, given both practical and regulatory constraints. To that end, Atmos Energy carefully monitors its system, devotes additional resources as necessary, and accelerates work when appropriate. This includes a comprehensive risk-based approach to prioritizing projects for the replacement of pipelines made of materials prone to leaks and potential failure. This approach is intended to proactively protect our customers and the public in general and permits Atmos Energy to monitor and inspect its system and renew pipe when needed, rather than doing so reactively.

Over the past year, Atmos Energy has been investing in infrastructure replacement through the capital investment recovered through its base rates and through fully utilizing the GSRS mechanism to address reactive facilities replacement in accordance with the statutory limitations on the use of that mechanism. During calendar year 2018, Atmos invested approximately \$16.9 million on GSRS related activities. Further, Atmos Energy invested an additional \$5.8 million in safety and reliability capital projects that are not recoverable through the GSRS. As a result of this investment, Atmos Energy replaced 17.6 miles of main comprised of bare steel, as well as 1,561 service lines. Approximately 14 of those miles and 1,461 of those bare steel services lines were in class 3 locations/urban areas.

#### 343 Plan Status Update

**TABLE 1 - 343 Statistics** 

	Reflected in 343 Plan	CY2018 Historical	CY2019 Projections
Number of Urban Areas	87	79	·
Miles of Bare Steel Main in Class 3 Locations	596	577	
Replacement Rate of Bare Steel Mains in Class 3 Locations (Miles/Year)	17 <sup>1</sup>	14	$9^{2}$
Number of Bare Steel Service Lines	28,000	18,577	17,327
Bare Steel Services Replacement (Lines/Year)	1,370	1,461	1,250
Miles of Cast Iron Mains	0	0	0
Years to Completion <sup>3</sup>	35	35	35

	CY2017	CY2018	CY2019
Underground Leaks per 100 Miles of Obsolete Piping	41.2	39.5	TBD
Total project cost, Current \$	\$348 million		

In 2018, the Company replaced fourteen miles of bare steel mains in class 3 locations and 18,577 steel service lines. Overall investment in safety, reliability, and GSRS increased in 2018 from 2017 levels, but the Company replaced pipe based on risk, not 343 specific qualifying materials.

Atmos Energy uses a risk ranking model to help determine the order in which to replace

<sup>&</sup>lt;sup>1</sup> This figure represents an average replacement rate over a 35-year period beginning in January 2019. The Company's 343 Plan did not project an estimated mileage to be replaced in 2019.

<sup>343</sup> Plan did not project an estimated mileage to be replaced in 2019.

<sup>2</sup> Atmos Energy's estimated forecasted budget for investment in safety and reliability is \$21.6 million for CY2019. However, at this time the Company can only provide an estimate of how many miles of bare steel main will be replaced in urban areas with that budgeted amount. Factors that will affect the actual replacement in 2019 include changes in estimated cost per mile of replacement, required public improvement spending, and required leak repair spending.

<sup>&</sup>lt;sup>3</sup> Atmos Energy's 343 Plan reflects a beginning date of January 2019. At this time, the Company's estimated number of years to complete the pipeline replacement described in the Plan has not been revised.

pipe. The model considers many factors to determine the likelihood of failure and the consequence of failure. Using these factors, the Company calculates a risk ranking of bare steel in class 3 location in 158 areas across 79 cities. The risk ranking methodology creates a score for each of the 158 areas using factors that assess likelihood of failure and consequence of failure. Atmos Energy has begun discussions with the Staff to provide further insight into the details and mechanics of the risk prioritization model and looks forward to continuing those discussions.

The Company notes that it has continued to increase its investment in safety and reliability from historical levels. A snapshot of the Company's fiscal year spending, based on 12-months ending September, shows a more consistent increase in safety and reliability spending over the past two years. The Company plans for this trend in increased spending to continue as the Company works with the Staff and the Commission to determine appropriate ratemaking treatment to support continued increases in investment levels. See Table 2 below.

TABLE 2 – Atmos Energy Fiscal Year Safety and Reliability Investment

	Fiscal 2017	Fiscal 2018	FY2019
	Historical	Historical	Projection <sup>4</sup>
Total Safety, Reliability, & GSRS Investment	\$16,777,634	\$18,476,504	\$22,035,755

<sup>&</sup>lt;sup>4</sup> Based on current forecasted budget.

**TABLE 3 – Estimated Replacement Costs** 

	343 Plan	CY2018 Historical	CY2019 Projections
Main Replacement (\$/mile)	\$ 525,000	\$ 535,000	\$ 540,000
Service Line Replacement (\$/ea.)	\$1,400	\$ 1,982	\$ 1,852

	2015-2017	CY2018	CY2019
Total Safety, Reliability, & GSRS Spending	\$ 18,299,984	\$ 23,250,158	\$ 21,686,594

	2016-2017	CY2018	CY2019
Average miles undesirable pipe replaced	53	30	23
Average cost of replacing undesirable pipe (\$/mile-equivalent)	\$ 504,444	\$338,349	\$ 287,000

Atmos Energy is achieving this level of investment by working closely with the communities we serve to coordinate projects to minimize disruption, achieve efficiencies, and maximize customer and community benefits. Using a cohesive communications plan, Atmos Energy is excelling at proactively sharing information and pre-planning with community leaders, which includes council meeting attendance, hosting community events, project signage, flyers, as well as partnering with city communications specialists who access social media to convey this information to the public. By way of example, Atmos Energy has extensive planned projects for 2019 in Olathe and Independence and has conducted successful outreach events in both communities with overwhelming positive response and feedback. Building on this success, the Company is planning future events that will seek to share project information with civic leaders. Consistent communication with the cities Atmos Energy serves, partnered with superior customer service, ensures a measure of trust with all community stakeholders.

As an additional benefit to Kansas communities, Atmos Energy's cross bore prevention procedures include camera scoping of sewer lines. This enables the Company to provide cities with electronic GPS mapping of their wastewater system in project areas, which is a substantial benefit for the cities' future maintenance and project planning.

#### **Plastic Pipe Data**

As the Staff notes in its Memorandum, Kansas pipeline safety regulations currently require plastic piping to be surveyed at least once every five years or as often as necessary, while bare steel piping is required to be surveyed at least once every three years. In discussions with the Staff, Atmos Energy agreed to conduct leak surveys on its plastic pipe inventory on a three-year frequency, which aligns with the frequency of surveys on its bare steel inventory. This approach allows Atmos Energy to efficiently schedule leak surveys across the system and provide for more frequent surveys of obsolete piping. In order to synchronize leak survey schedules, Atmos Energy committed to transition to a more frequent leak survey of plastic piping over a three-year period beginning in 2019. Pursuant to the Staff's recommendation in its Memorandum, Atmos Energy has attached to this Annual Report as Attachment A leak data on plastic pipe that includes the type of plastic, its manufacturer, and date of installation along with the characteristics of the leak in the format created by the American Gas Association Plastic Pipe Database Committee.

#### Lost and Unaccounted for Gas ("L&U") Report

Atmos Energy submits to the Commission a total L&U for the state of Kansas. In its 343 Plan, the Company stated that beginning in 2019, Atmos Energy would additionally submit the L&U for cities with more than 10,000 customers. For Atmos Energy, this includes piping in Johnson County that is connected to the Olathe system. The data regarding this system is shown in the table

below. However, the Company cautions against the over-reliance on the use of L&U as a significant determinant in measuring the effectiveness of a pipe replacement plan. There are many factors that contribute to L&U including but not limited to measurement, third-party damage, billing errors, leakage and the timing of billing and consumption.

TABLE 4 – L&U - Johnson County Contiguous System

			Known	L&U	L&U
Year	Gas In	Gas Out	Loss	Volume	Percentage
2018	9,910,768	10,180,650	2,279	272,161	2.74

#### **Pipeline Safety Management System**

The Staff's Memorandum also includes a recommendation that "the Utilities provide a summary of progress made to adopt/implement [a Pipeline Safety Management System (PSMS) as described in API Recommended Practice 1173] as part of their annual progress report." The Staff clarified that its recommendation is not to require that the PSMS be adopted by any certain date but rather to request an update on the status of the Utilities' activities informed by the Recommended Practice. Currently, the practices and procedures of Atmos Energy reflect the elements highlighted in API 1173. To formalize and refine this approach, Atmos Energy is committed to adopt API 1173 and is working to develop an implementation roadmap.

## ATTACHMENT A

HDPE- 3408 DRIS #N/A HDPE- 3408 POL* #N/A #N/A #N/A MDPE - 2406 DRIS #N/A HDPE- 3408 POL* #N/A MDPE - 2406 DRIS MDPE - 2406 DRIS	ANUFACTURER  ISCOPIPE  #N/A I YPIPF	1. ASTM F2897 16-CHARACTER CODE	SCHEDOLL OF WALLE	1. NOMINAL SIZE	2. DATE of MANUFACTURE	3. METHOD of	4. TYPE of SOIL in	ATION and OPERATIONS SECTIONS  5. OPERATING PRESSURE (psig)		6. DATE of	7a. FAILURE / LEAK LOCATION	7b. FAILURE / LEAK in FITTING	IF "OTHER" on 7b please	FAILURE ANALYSIS SECTION  7c. FAILURE / LEAK in JOINT IF "OTHER" on 7c	8. FAILURE / LEAK CAUSE	IF "OTHER" FAILURE /	9. DATE OF
HDPE- 3408 DRIS #N/A HDPE- 3408 POL* #N/A #N/A #N/A MDPE - 2406 DRIS #N/A HDPE- 3408 POL* #N/A MDPE - 2406 DRIS MDPE - 2406 DRIS	ISCOPIPE #N/A			SIZE		INICTALLACTICS					AUTHORE / EEAN EGGATION	76. TAILORE / LEAK III TITTING			O. TAILORE / LEAK CAOSE		5. DATE OF
#N/A HDPE-3408 POL' #N/A #N/A #N/A MDPE-2406 DRIS HDPE-3409 DRIS #N/A HDPE-3408 POL' #N/A MDPE-2406 DRIS MDPE-2406 DRIS	#N/A	FRINT LINE OF LABEL	THICKNESS			INSTALLATION	CONTACT WITH PIPE	at time of failure	PRESSURE (psig) normal range	INSTALLATION			describe here	please describe here		LEAK CAUSE please describe here	FAILURE / LEAK
HDPE- 3408 POL*  #N/A  #N/A  #N/A  MDPE - 2406 DRIS  #N/A  HDPE- 3408 POL*  #N/A  MDPE- 2406 DRIS  MDPE- 2406 DRIS  MDPE- 2406 DRIS		Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)			nere	PREVIOUS IMPACT	describe nere	3/21/2018
#N/A #N/A #N/A MDPE - 2406 DRIS HDPE - 3406 WN/A HDPE - 3408 POL' #N/A MDPE - 2406 DRIS MDPE - 2406 DRIS		Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				PREVIOUS IMPACT		5/16/2018
#N/A #N/A DRIS HDPE - 2406 DRIS HDPE - 3406 DRIS #N/A HDPE - 3408 POL' #N/A MDPE - 2406 DRIS MDPE - 2406 DRIS	#N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) PIPE (Go to Failure/Leak Cause)	VALVE			MATERIAL DEFECT (Describe)  EXCESS EXTERNAL EARTH LOADING	Valve Stem	3/21/2018 5/29/2018
MDPE - 2406 DRIS HDPE - 3406 DRIS #N/A HDPE - 3408 POLY #N/A MDPE - 2406 DRIS MDPE - 2406 DRIS	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	OTHER	Elbow		CORROSION		6/5/2018
#N/A HDPE - 3406 DRIS #N/A HDPE - 3408 POLY #N/A MDPE - 2406 DRIS MDPE - 2406 DRIS	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)	7,05,055,010			EXCESS EXTERNAL EARTH LOADING		6/1/2018
#N/A POL' #N/A DRIS MDPE - 2406 DRIS MDPE - 2406 DRIS	ISCOPIPE ISCOPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown	FITTING (Complete 7b) PIPE (Go to Failure/Leak Cause)	THREADED CAP	Тар		EXCESS EXTERNAL EARTH LOADING PREVIOUS IMPACT		6/19/2018 7/3/2018
#N/A MDPE - 2406 DRIS MDPE - 2406 DRIS	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/1/2018
MDPE - 2406 DRIS	LYPIPE	Unknown Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		11/9/2018
MDPE - 2406 DRIS	#N/A ISCOPIPE	Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	PIPE (Go to Failure/Leak Cause) PIPE (Go to Failure/Leak Cause)				MATERIAL DEFECT (Describe)  EXCESS EXTERNAL EARTH LOADING		2/24/2018 3/17/2018
MDPE - 2406 DRIS	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				#N/A		1/1/2018
	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)			FLECTROFLICION	PREVIOUS IMPACT		3/30/2018
#N/A #N/A	#N/A #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown	JOINT (Complete 7c) PIPE (Go to Failure/Leak Cause)			ELECTROFUSION	MATERIAL DEFECT (Describe)  EXCESS EXTERNAL EARTH LOADING		4/12/2018 4/12/2018
	LYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		4/9/2018
	ISCOPIPE #NI/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP			EXCESS EXTERNAL EARTH LOADING		12/5/2017
#N/A #N/A	#N/A #N/A	Unknown	Unknown Unknown	Unknown	Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) PIPE (Go to Failure/Leak Cause)	MECHANICAL FITTING (Stab)			EXCESS EXTERNAL EARTH LOADING MATERIAL DEFECT (Describe)		4/18/2018 6/13/2018
MDPE - 2406 POL	LYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				PREVIOUS IMPACT		6/26/2018
MDPE - 2406 POLY	LYPIPE #N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				MATERIAL DEFECT (Describe) PREVIOUS IMPACT		8/30/2017 7/18/2017
#N/A #N/A	#N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	PIPE (Go to Failure/Leak Cause) FITTING (Complete 7b)	THREADED CAP	Constab Cap		MATERIAL DEFECT (Describe)	Unknown	10/18/2017
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP	Тар		MATERIAL DEFECT (Describe)	Unknown	8/30/2017
	LYPIPE LYPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) FITTING (Complete 7b)	OTHER TRANSITION	Unknown	<del>                                     </del>	MATERIAL DEFECT (Describe)  MATERIAL DEFECT (Describe)	Unknown	9/15/2016 8/23/2016
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)	TIMINSTITUTE		OTHER	EXCESS EXTERNAL EARTH LOADING		6/15/2018
	EXCO	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Stab)			EXCESS EXTERNAL EARTH LOADING		12/5/2017
ABS POL'	LYPIPE #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown	FITTING (Complete 7b) PIPE (Go to Failure/Leak Cause)	TRANSITION	1		MATERIAL DEFECT (Describe) PREVIOUS IMPACT		7/31/2017 8/28/2018
	#N/A LYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Stab)		<u>                                     </u>	MATERIAL DEFECT (Describe)		8/28/2018
MDPE - 2406 DRIS	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			OTHER	EXCESS EXTERNAL EARTH LOADING		3/19/2018
#N/A #N/A	#N/A #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) FITTING (Complete 7b)	MECHANICAL FITTING (Other, Describe) THREADED CAP	Mechanical Service Tee		MATERIAL DEFECT (Describe) CORROSION		8/20/2018 4/12/2017
#N/A #N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Other, Describe)	Split Sleeve		EXCESS EXTERNAL EARTH LOADING		3/15/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Stab)			EXCESS EXTERNAL EARTH LOADING		8/20/2018
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#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				CORROSION		5/10/2018
PVC	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)				PREVIOUS IMPACT		7/24/2018
#N/A	#N/A #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	JOINT (Complete 7c)			SOLVENT	EXCESS EXTERNAL EARTH LOADING MATERIAL DEFECT (Describe)		8/24/2018 3/30/2016
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			SOLVENT	MATERIAL DEFECT (Describe)		3/29/2016
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			SOLVENT	MATERIAL DEFECT (Describe)		3/29/2016
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	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Stab)			MATERIAL DEFECT (Describe)		8/13/2018
HDPE - 3406 DRIS	ISCOPIPE #N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				CORROSION #N/A		11/19/2018
#N/A #N/A	#N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	PIPE (Go to Failure/Leak Cause) JOINT (Complete 7c)			OTHER	#N/A #N/A		11/21/2018 12/14/2017
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			OTHER	#N/A		12/14/2017
#N/A #N/A	#N/A #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	JOINT (Complete 7c) FITTING (Complete 7b)	OTHER	Gas Light		#N/A EXCESS EXTERNAL EARTH LOADING		4/12/2018 4/25/2018
	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)	OTHER	Ous Light	BUTT FUSION	MATERIAL DEFECT (Describe)	Failed Fuse	1/29/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING	Natural Forces	5/12/2017
#N/A HDPF - 3406 POL	#N/A LYPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	PIPE (Go to Failure/Leak Cause) PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING #N/A	Natural Forces	12/4/2017 10/2/2017
	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	OTHER	Unknown		OTHER	Unknown	1/26/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING	Natural Forces	10/20/2017
#N/A #N/A	#N/A #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown	JOINT (Complete 7c) JOINT (Complete 7c)			BUTT FUSION	INSTALLATION ERROR MATERIAL DEFECT (Describe)	Stripped Threads Failed Fuse	1/16/2018 1/26/2018
#N/A	#N/A	Unknown	Unknown	Unknown		Unknown	OTHER	Unknown	Unknown		PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		2/23/2018
MDPE - 2306 DRIS MDPE - 2406	ISCOPIPE #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) FITTING (Complete 7b)	THREADED CAP THREADED CAP			INSTALLATION ERROR MATERIAL DEFECT (Describe)		2/24/2018 9/26/2016
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Other, Describe)	Nipple		MATERIAL DEFECT (Describe)	Pipe Dope	12/10/2017
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)	METER RISER			CORROSION		2/1/2018
	ISCOPIPE ISCOPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	JOINT (Complete 7c) JOINT (Complete 7c)	OTHER	Bell Reducer	OTHER BUTT FUSION	MATERIAL DEFECT (Describe) INSTALLATION ERROR		10/5/2017 2/22/2018
#N/A DRIS	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)	<u> </u>		BOTTTOSION	CORROSION		3/10/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)	METER RISER	Valve		MATERIAL DEFECT (Describe)	Leaking Valve	12/29/2017
#N/A MDPE - 2406	#N/A #N/A	Unknown	Unknown	Unknown	Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause) PIPE (Go to Failure/Leak Cause)		1	<del>                                     </del>	EXCESS EXTERNAL EARTH LOADING MATERIAL DEFECT (Describe)		3/1/2018 3/12/2018
	#N/A ISCOPIPE	Unknown Unknown	Unknown Unknown	Unknown Unknown	Unknown Unknown	Unknown	OTHER	Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b)	THREADED CAP	†		MATERIAL DEFECT (Describe)		10/5/2017
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				#N/A		4/24/2018
MDPE - 2406 HDPE - 3406 DRIS	#N/A ISCOPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) FITTING (Complete 7b)	OTHER THREADED CAP	1	<del>                                     </del>	MATERIAL DEFECT (Describe) INSTALLATION ERROR	Unknown	4/12/2018 4/17/2018
	EXCO	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)		<u> </u>	OTHER	MATERIAL DEFECT (Describe)	Grill Line	5/14/2018
	LYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Stab)			EXCESS EXTERNAL EARTH LOADING		5/15/2018
	ISCOPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	FITTING (Complete 7b) FITTING (Complete 7b)	THREADED CAP METER RISER			INSTALLATION ERROR MATERIAL DEFECT (Describe)	Stripped Threads	4/23/2018 12/12/2016
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)		<u> </u>		MATERIAL DEFECT (Describe)	BS Yardline	6/20/2018
	LYPIPE	Unknown	Unknown		Unknown	Unknown	OTHER	Unknown	Unknown		PIPE (Go to Failure/Leak Cause)		1		PREVIOUS IMPACT	BC V	6/27/2018
#N/A #N/A	#N/A #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown	PIPE (Go to Failure/Leak Cause) PIPE (Go to Failure/Leak Cause)	+			MATERIAL DEFECT (Describe) EXCESS EXTERNAL EARTH LOADING	BS Yardline	6/20/2018 7/19/2018
	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP	1		MATERIAL DEFECT (Describe)		6/20/2018
#N/A	#N/A	Unknown	Unknown	Unknown		Unknown	OTHER	Unknown	Unknown		PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		7/24/2018
MDPE - 2306 POLY	LYPIPE #N/A	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown		PIPE (Go to Failure/Leak Cause) PIPE (Go to Failure/Leak Cause)	+	+		EXCESS EXTERNAL EARTH LOADING EXCESS EXTERNAL EARTH LOADING		7/26/2018 7/8/2018
MDPE - 2306 POL	LYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	MECHANICAL FITTING (Other, Describe)	Union		EXCESS EXTERNAL EARTH LOADING		7/16/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown		PIPE (Go to Failure/Leak Cause)			COCKET ELICION	MATERIAL DEFECT (Describe)	Falled For	7/17/2018
	LYPIPE LYPIPE	Unknown Unknown	Unknown Unknown	Unknown Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	JOINT (Complete 7c) PIPE (Go to Failure/Leak Cause)	+	+	SOCKET FUSION	MATERIAL DEFECT (Describe) EXCESS EXTERNAL EARTH LOADING	Failed Fuse	7/1/2018 7/13/2018
MDPE - 2306 POL	LYPIPE	Unknown	Unknown		Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		7/20/2018
	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	OTHER	Тар		PREVIOUS IMPACT		7/7/2018
#N/A MDPE - 2306 POLY	#N/A LYPIPE	Unknown Unknown	Unknown Unknown	Unknown	Unknown Unknown	Unknown Unknown	OTHER OTHER	Unknown Unknown	Unknown Unknown	Unknown Unknown	PIPE (Go to Failure/Leak Cause) PIPE (Go to Failure/Leak Cause)	+	+		EXCESS EXTERNAL EARTH LOADING EXCESS EXTERNAL EARTH LOADING		7/25/2018 7/18/2018
HDPE - 3406 DRIS	ISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP			INSTALLATION ERROR		5/16/2018
MDPE - 2306 POL	LYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/15/2018

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MDPE - 2406	DRISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP	Тар		MATERIAL DEFECT (Describe)	Fusion Defect	3/16/2016
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			OTHER	PREVIOUS IMPACT		8/19/2018
MDPE - 2306	POLYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/2/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			OTHER	EXCESS EXTERNAL EARTH LOADING		8/3/2018
MDPE - 2306	POLYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/3/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				CORROSION		8/1/2018
MDPE - 2306	POLYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/2/2018
MDPE - 2306	POLYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/3/2018
HDPE- 3408	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			OTHER	CORROSION		8/24/2018
MDPE - 2306	POLYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/10/2018
MDPE - 2406	PERFORMANCE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			OTHER	EXCESS EXTERNAL EARTH LOADING		8/8/2018
MDPE - 2406	DRISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP	Тар		INSTALLATION ERROR		8/2/2018
MDPE - 2306	DUPONT	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/14/2018
MDPE - 2306	POLYPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				EXCESS EXTERNAL EARTH LOADING		8/13/2018
MDPE - 2406	DRISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			SOCKET FUSION	INSTALLATION ERROR		5/31/2016
MDPE - 2406	DRISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP	O Ring & Tap		THREADED CAP (Seal/O-ring defect)		7/3/2016
MDPE - 2406	DRISCOPIPE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	FITTING (Complete 7b)	THREADED CAP	Тар		INSTALLATION ERROR		7/29/2016
MDPE - 2306	PERFORMANCE	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			SOCKET FUSION	MATERIAL DEFECT (Describe)		9/27/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	PIPE (Go to Failure/Leak Cause)				MATERIAL DEFECT (Describe)		7/22/2018
#N/A	#N/A	Unknown	Unknown	Unknown	Unknown	Unknown	OTHER	Unknown	Unknown	Unknown	JOINT (Complete 7c)			BUTT FUSION	MATERIAL DEFECT (Describe)		9/26/2018